EXHIBIT A28

DIFFRACTION VERIFICATIONS

1) M69042-001
2) M69042-002
3) M69042-003
4) M69042-004
5) M69042-008
6) M69042-010

<u>VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS</u>

<u>CAMERA CONSTANT (pixelÅ)</u> = SPACING (Å)
MEASURED DISTANCE (pixels)

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spancing	Range +/- 5%
Grunerite	449	31-631	5.2	4.94 - 5.46
Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
181.8	35	5.19

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **<u>Anthophyllite</u>**

MAS Job #:   <u>M69042-001-001-Dif 1</u>   Film #: <u>41326</u>

Analyst: <u>MM</u>   Date of Photo: <u>10/25/2018</u>

Date Verified: <u>10/25/2018</u>   EDS Verified: <u>Yes</u>

<u>Zone Axis Information</u>
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

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Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
181.8	35	5.19

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-001-001-Dif 2**   Film #: **41330**

Analyst: **MM**   Date of Photo: **10/26/2018**

Date Verified: **10/26/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

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Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
181.8	35	5.19

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-001-002-Dif 1**   Film #: **41332**

Analyst: **MM**   Date of Photo: **10/26/2018**

Date Verified: **10/26/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

$$\text{CAMERA CONSTANT (pixelÅ)} = \frac{\text{SPACING (Å)}}{\text{MEASURED DISTANCE (pixels)}}$$

1) The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

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Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
181.8	35	5.19

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-001-002-Dif 2**   Film #: **41334**

Analyst: **MM**   Date of Photo: **10/26/2018**

Date Verified: **10/26/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

$$\text{CAMERA CONSTANT (pixelÅ)} = \frac{\text{SPACING (Å)}}{\text{MEASURED DISTANCE (pixels)}}$$

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

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Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
181.8	35	5.19

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-001-003-Dif 1**   Film #: **41335**

Analyst: **MM**   Date of Photo: **10/26/2018**

Date Verified: **10/26/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spacing (Å)	Range +/- 5%
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Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
181.8	35	5.19

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-001-003-Dif 2**   Film #: **41336**

Analyst: **MM**   Date of Photo: **10/26/2018**

Date Verified: **10/26/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

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Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
181.8	35	5.19

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-001-004-Dif 1**   Film #: **41338**

Analyst: **MM**   Date of Photo: **10/26/2018**

Date Verified: **10/26/2018**   EDS Verified: **Yes**

Zone Axis Information

d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1) The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

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Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
181.8	35	5.19

Streaking Observed: _____   **Closely spaced dots:** _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-001-004-Dif 2**   **Film #:** **41339**

Analyst: **MM**   **Date of Photo:** **10/26/2018**

Date Verified: **10/26/2018**   **EDS Verified:** **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1) The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

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Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
181.8	35	5.19

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-001-005-Dif 1**   Film #: **41342**

Analyst: **MM**   Date of Photo: **10/26/2018**

Date Verified: **10/26/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

$$\text{CAMERA CONSTANT (pixelÅ)} = \frac{\text{SPACING (Å)}}{\text{MEASURED DISTANCE (pixels)}}$$

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

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Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
181.8	35	5.19

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-001-005-Dif 2**   Film #: **41343**

Analyst: **MM**   Date of Photo: **10/26/2018**

Date Verified: **10/26/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

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Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
521.2	297	1.75

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-002-001 Dif1**   Film #: **2 4520**

Analyst: **AK**   Date of Photo: **9/26/2018**

Date Verified: **9/26/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =   1.75
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

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Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
521.2	300	1.74

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-002-001 Dif2**   Film #: **2 4521**

Analyst: **AK**   Date of Photo: **9/26/2018**

Date Verified: **9/26/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1) The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

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Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
521.2	100	5.21

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-002-002 Dif1**   Film #: **2 4531**

Analyst: **AK**   Date of Photo: **9/27/2018**

Date Verified: **9/27/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

$$\text{CAMERA CONSTANT (pixelÅ)} = \frac{\text{SPACING (Å)}}{\text{MEASURED DISTANCE (pixels)}}$$

1) The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

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Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
521.2	295	1.77

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-002-002 Dif2**   Film #: **2 4537**

Analyst: **AK**   Date of Photo: **9/27/2018**

Date Verified: **9/27/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

$$\frac{\text{CAMERA CONSTANT (pixelÅ)}}{\text{MEASURED DISTANCE (pixels)}} = \text{SPACING (Å)}$$

1) The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

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Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
521.2	346	1.51

Streaking Observed: _____   **Closely spaced dots:** _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-002-003 Dif1**   **Film #: 2 4539**

Analyst: **AK**   **Date of Photo: 9/27/2018**

Date Verified: **9/27/2018**   **EDS Verified: Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1) The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

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VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
521.2	100	5.21

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-002-003 Dif2**   Film #: **2 4797**

Analyst: **AK**   Date of Photo: **10/27/2018**

Date Verified: **10/27/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

$$\underline{\text{CAMERA CONSTANT (pixelÅ)}} = \text{SPACING (Å)}$$
$$\text{MEASURED DISTANCE (pixels)}$$

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

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Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
521.2	102	5.11

Streaking Observed: _____   **Closely spaced dots:** _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-002-004 Dif1**   **Film #: 2 4543**

Analyst: AK   **Date of Photo: 9/27/2018**

Date Verified: **9/27/2018**   **EDS Verified: Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1) The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spancing (Å)	Range +/- 5%
Grunerite	449	31-631	5.2	4.94 - 5.46
Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
521.2	239	2.18

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-002-004 Dif2**   Film #: **2 4545**

Analyst: **AK**   Date of Photo: **9/27/2018**

Date Verified: **9/27/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1)	The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spancing (Å)	Range +/- 5%
Grunerite	449	31-631	5.2	4.94 - 5.46
Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
521.2	224	2.33

Streaking Observed: _____		Closely spaced dots: _____

Type of amphibole diffraction verified:		**Anthophyllite**

MAS Job #:		**M69042-002-005 Dif1**			Film #: **2 4547**

Analyst: **AK**						Date of Photo: **9/28/2018**

Date Verified:		**9/28/2018**			EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spacing (Å)	Range +/- 5%
Grunerite	449	31-631	5.2	4.94 - 5.46
Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
521.2	102.2	5.10

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-002-005 Dif2**   Film #: **2 4556**

Analyst: **AK**   Date of Photo: **9/28/2018**

Date Verified: **9/28/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1) The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spacing (Å)	Range +/- 5%
Grunerite	449	31-631	5.2	4.94 - 5.46
Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
521.2	200	2.61

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-002-006 Dif1**   Film #: **2 4557**

Analyst: **AK**   Date of Photo: **9/28/2018**

Date Verified: **9/28/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spacing (Å)	Range +/- 5%
Grunerite	449	31-631	5.2	4.94 - 5.46
Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
521.2	97.5	5.35

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-002-006 Dif2**   Film #: **2 4558**

Analyst: **AK**   Date of Photo: **9/28/2018**

Date Verified: **9/28/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spacing (Å)	Range +/- 5%
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Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
521.2	103.5	5.04

Streaking Observed: _____   **Closely spaced dots:** _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-002-007 Dif1**   **Film #: 2 4561**

Analyst: **AK**   **Date of Photo: 9/28/2018**

Date Verified: **9/28/2018**   **EDS Verified: Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1) The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spancing (Å)	Range +/- 5%
Grunerite	449	31-631	5.2	4.94 - 5.46
Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
521.2	101	5.16

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-002-007 Dif2**   Film #: **2 4795**

Analyst: **AK**   Date of Photo: **10/27/2018**

Date Verified: **10/27/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1) The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spancing	Range +/- 5%
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Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
191.7	37	5.18

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Tremolite**

MAS Job #: M69042-003-001   Film #: **310065**

Analyst: **ES**   Date of Photo: **9/28/2018**

Date Verified: 1/31/2019   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1) The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spacing (Å)	Range +/- 5%
Grunerite	449	31-631	5.2	4.94 - 5.46
Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
191.8	35	5.48

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #: M69042-003-002 Diffraction 1   Film #: 310073

Analyst: ES   Date of Photo: 10/1/2018

Date Verified: 1/31/2019   EDS Verified: Yes

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

$$\frac{\text{CAMERA CONSTANT (pixel\AA)}}{\text{MEASURED DISTANCE (pixels)}} = \text{SPACING (\AA)}$$

1) The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spancing (Å)	Range +/- 5%
Grunerite	449	31-631	5.2	4.94 - 5.46
Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
521.2	96	5.43

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: __Anthophyllite__

MAS Job #: M69042-003-002 Diffraction 2   Film #: __24799__

Analyst: __ES__   Date of Photo: __10/27/2018__

Date Verified: 1/31/19   EDS Verified: __Yes__

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1) The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spancing	Range +/- 5%
Grunerite	449	31-631	5.2	4.94 - 5.46
Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
191.7	35	5.48

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-004-001**   Film #: **310374**

Analyst: **JGC**   Date of Photo: **10/15/2018**

Date Verified: **10/15/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

<u>VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS</u>

<u>CAMERA CONSTANT (pixelÅ)</u> = SPACING (Å)
MEASURED DISTANCE (pixels)

1) The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spacing (Å)	Range +/- 5%
Grunerite	449	31-631	5.2	4.94 - 5.46
Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
521.2	95	5.49

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: <u>Anthophyllite</u>

MAS Job #:   <u>M69042-001-001 Diff2</u>   Film #: <u>2 4805</u>

Analyst: <u>JGC</u>   Date of Photo: <u>10/28/2018</u>

Date Verified: <u>2/1/2019</u>   EDS Verified: <u>Yes</u>

<u>Zone Axis Information</u>
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spancing (Å)	Range +/- 5%
Grunerite	449	31-631	5.2	4.94 - 5.46
Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
191.7	36	5.33

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-004-002**   Film #: **310387**

Analyst: **JGC**   Date of Photo: **10/15/2018**

Date Verified: **10/15/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

$$\text{CAMERA CONSTANT (pixel\AA)} = \frac{\text{SPACING (\AA)}}{\text{MEASURED DISTANCE (pixels)}}$$

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spancing (Å)	Range +/- 5%
Grunerite	449	31-631	5.2	4.94 - 5.46
Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
521.2	96	5.43

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-004-002 Diff2**   Film #: **2 4807**

Analyst: **JGC**   Date of Photo: **10/28/2018**

Date Verified: **2/1/2019**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

$$\text{CAMERA CONSTANT (pixelÅ)} = \frac{\text{SPACING (Å)}}{\text{MEASURED DISTANCE (pixels)}}$$

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

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Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
191.7	35	5.48

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-004-003**   Film #: **310396**

Analyst: **JGC**   Date of Photo: **10/16/2018**

Date Verified: **10/16/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1) The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spancing (Å)	Range +/- 5%
Grunerite	449	31-631	5.2	4.94 - 5.46
Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
521.2	96	5.43

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-004-003 Diff2**   Film #: **2 4808**

Analyst: **JGC**   Date of Photo: **10/28/2018**

Date Verified: **2/1/2019**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

<u>VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS</u>

<u>CAMERA CONSTANT (pixelÅ)</u> = SPACING (Å)
<u>MEASURED DISTANCE (pixels)</u>

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

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Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
522.2	103	5.07

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: <u>Anthophyllite</u>

MAS Job #:   <u>M69042-008-001</u>   Film #: <u>2 4654</u>

Analyst: <u>AK</u>   Date of Photo: <u>10/18/2018</u>

Date Verified: <u>10/18/2018</u>   EDS Verified: <u>Yes</u>

<u>Zone Axis Information</u>
d(hk0) =   NA
d(hkl) =   NA
Angle =   NA
ZA =   NA

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spancing (Å)	Range +/- 5%
Grunerite	449	31-631	5.2	4.94 - 5.46
Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
522.2	99	5.27

Streaking Observed: _____   **Closely spaced dots:** _____

Type of amphibole diffraction verified: <u>Anthophyllite</u>

MAS Job #:   <u>M69042-008-001 Dif2</u>   **Film #:** <u>2 4656</u>

Analyst: <u>AK</u>   **Date of Photo:** <u>10/18/2018</u>

Date Verified: <u>10/29/2018</u>   **EDS Verified:** <u>Yes</u>

Zone Axis Information
d(hk0) =   6.25
d(hkl) =   3.76
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spancing (Å)	Range +/- 5%
Grunerite	449	31-631	5.2	4.94 - 5.46
Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
522.2	38.8	13.46

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-008-002**   Film #: **2 4671**

Analyst: **AK**   Date of Photo: **10/19/2018**

Date Verified: **10/19/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

$$\text{CAMERA CONSTANT (pixel\AA)} = \frac{\text{SPACING (\AA)}}{\text{MEASURED DISTANCE (pixels)}}$$

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spancing (Å)	Range +/- 5%
Grunerite	449	31-631	5.2	4.94 - 5.46
Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
524.4	102	5.14

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-008-002 dif2**   Film #: **2 4814**

Analyst: **AK**   Date of Photo: **10/29/2018**

Date Verified: **10/29/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spacing (Å)	Range +/- 5%
Grunerite	449	31-631	5.2	4.94 - 5.46
Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
522.2	98.5	5.30

Streaking Observed: _____   **Closely spaced dots:** _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-008-003**   **Film #: 2 4666**

Analyst: AK   **Date of Photo: 10/19/2018**

Date Verified: **10/19/2018**   **EDS Verified: Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spancing (Å)	Range +/- 5%
Grunerite	449	31-631	5.2	4.94 - 5.46
Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
524.4	101	5.19

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #:   **M69042-008-003 dif2**   Film #: **2 4816**

Analyst: **AK**   Date of Photo: **10/29/2018**

Date Verified: **10/29/2018**   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1) The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spancing	Range +/- 5%
Grunerite	449	31-631	5.2	4.94 - 5.46
Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
187.6	37	5.07

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #: M69042-010-001 Diffraction 1   Film #: **310450**

Analyst: **ES**   Date of Photo: **10/19/2018**

Date Verified: 1/31/2019   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1) The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spancing (Å)	Range +/- 5%
Grunerite	449	31-631	5.2	4.94 - 5.46
Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
524.4	104	5.04

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #: M69042-010-001 Diffraction 2   Film #: **24819**

Analyst: **ES**   Date of Photo: **10/29/2018**

Date Verified: 1/31/2019   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spancing (Å)	Range +/- 5%
Grunerite	449	31-631	5.2	4.94 - 5.46
Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
187.6	35	5.36

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #: M69042-010-002 Diffraction 1   Film #: **310465**

Analyst: **ES**   Date of Photo: **10/19/2018**

Date Verified: 1/31/2019   EDS Verified: **Yes**

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =

VERIFICATION OF ZERO DEGREE AMPHIBOLE DIFFRACTION PATTERNS

CAMERA CONSTANT (pixelÅ) = SPACING (Å)
MEASURED DISTANCE (pixels)

1)   The calculated spacings should be within +/- 5% of the 001 d-spacing (interrow spacing). The acceptable range for all of the amphiboles is given in the chart below. The page number is given to locate the file card in the Mineral Powder Diffraction File Data book for each type of amphibole and the interrow spacing is given for each amphibole.

Amphibole Type	Pg. #	Card #	Calculated Spancing (Å)	Range +/- 5%
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Actinolite	4	25-157	5.13	4.87 - 5.39
Tremolite	1192	13-437	5.09	4.84 - 5.34
Crocidolite	993	19-1061	5.19	4.93 - 5.45
Anthophyllite	48	9-455	5.28	5.02 - 5.54

VERIFICATION OF AMPHIBOLE DIFFRACTION PATTERN AT ZERO TILT

Camera K (pixelÅ)	Meas. Distance (pixels)	Calculate Spacing (Å)
184.6	34	5.43

Streaking Observed: _____   Closely spaced dots: _____

Type of amphibole diffraction verified: **Anthophyllite**

MAS Job #: M69042-010-002 Diffraction 2   Film #: 310597

Analyst: ES   Date of Photo: 10/29/2018

Date Verified: 1/31/2019   EDS Verified: Yes

Zone Axis Information
d(hk0) =
d(hkl) =
Angle =
ZA =